

CLAIMS

1. An emulsification/dispersion system comprising:

supply means for supplying a liquid material to be emulsified/dispersed;

5 an emulsification/dispersion apparatus for emulsifying/dispersing said liquid material supplied from said supply means, by means of a shearing force;

a communication passage connected to an outlet portion of said emulsification/ dispersion apparatus; and

10 a multistage depressurization module connected to the downstream of said communication passage, said multistage depressurization module including an inlet passage, an outlet passage, and at least two depressurization members located between said inlet and
15 outlet passages and connected with each other in a multistage manner through a connection member, said multistage depressurization module being operable to apply a given backpressure to the outlet portion of said emulsification/dispersion apparatus and to reduce said
20 backpressure in a stepwise manner so that the depressurization member in the final stage provides a reduced pressure causing no bubbling in said outlet passage.

2. The emulsification/dispersion system according to claim 1, wherein said depressurization members are composed
25 of at least one first depressurization member having a

first inner diameter D_1 , at least one second depressurization member having a second inner diameter D_2 and at least one third depressurization member having a third inner diameter D_3 , which are arranged in this order
5 from the upstream side, wherein said first to third inner diameters D_1 , D_2 , D_3 are designed to satisfy the following relationship: D_0 , $D_2 > D_3 > D_1$, wherein D_0 is the passage diameter of said outlet passage.

3. The emulsification/dispersion system according to
10 claim 2, which satisfies the following relationship: $D_s \geq D_2$, wherein D_s is the inner diameter of said connection member.

4. The emulsification/dispersion system according to claim 1, wherein all of said depressurization members have
15 the same inner diameter, or at least one of said depressurization members on the downstream side has an inner diameter less than that of at least one of the remaining depressurization members on the upstream side.

5. The emulsification/dispersion system according to
20 claim 4, wherein said connection member has an inner diameter greater than that of each of said depressurization members.

6. The emulsification/dispersion system according to claim 1, which includes a heat exchanger interposed in said
25 communication passage.

7. A multistage emulsification/dispersion system comprising:

supply means for pressurizing a liquid material to be emulsified/dispersed, and supplying said pressurized
5 liquid material;

a multistage emulsification/dispersion module including an inlet portion having orifice means, an outlet portion, a plurality of absorption cells interposed in a passage extending from said inlet and outlet portions and
10 connected with each other in a multistage manner through a connection member;

a communication passage connected to an outlet portion of said multistage emulsification/dispersion module; and

15 a multistage depressurization module including an inlet passage connected to the downstream of said communication passage, an outlet passage opened to atmosphere, a plurality of depressurization members located between said inlet and outlet passages and connected with
20 each other in a multistage manner through a connection member, said depressurization members being composed of at least one first depressurization member having a first inner diameter D_1 , at least one second depressurization member having a second inner diameter D_2 and at least one
25 third depressurization member having a third inner diameter

D_3 , which are arranged in this order from the upstream side, wherein said first to third inner diameters D_1 , D_2 , D_3 are designed to satisfy the following relationship: D_0 , $D_2 > D_1 > D_3$, wherein D_0 is the passage diameter of said outlet
5 passage.

8. The multistage emulsification/dispersion system according to claim 7, wherein said plurality of absorption cells are composed of at least one first absorption cell having a first inner diameter D_1 , at least one second
10 absorption cell having a second inner diameter D_2 and at least one third absorption cell having a third inner diameter D_3 , which are arranged in this order from the side of said orifice means, wherein said diameters D_1 , D_2 , D_3 are designed to satisfy the following relationship: $D_2 > D_1 > D_3$.

15 9. The multistage emulsification/dispersion system according to claim 7 or 8, which includes a heat exchanger interposed in said communication passage.

10. A multistage emulsification/dispersion system comprising:

20 supply means for pressurizing a liquid material to be emulsified/dispersed, and supplying said pressurized liquid material;

a multistage emulsification/dispersion module including an inlet portion having orifice means, an outlet
25 portion, a plurality of absorption cells interposed in a

passage extending from said inlet and outlet portions and connected with each other in a multistage manner through a connection member;

5 a communication passage connected to an outlet portion of said multistage emulsification/dispersion module; and

10 a multistage depressurization module including an inlet passage connected to the downstream of said communication passage, an outlet passage opened to atmosphere, a plurality of depressurization members located between said inlet and outlet passages and connected with each other in a multistage manner through a connection member,

15 wherein, provided said respective absorption cells, said communication passage and said respective depressurization members are defined as individual passage units each having a given passage diameter, the respective passage diameters of said passage units are determined according to the following rules:

20 (1) each of said passage units has either one of at least three different passage diameters D_S , D_M , D_B ($D_S < D_M < D_B$), wherein when the passage unit with the passage diameter D_M is connected to the downstream of the passage unit with the passage diameter D_S , the passage unit with
25 the passage diameter D_B is connected between said two

passage units; and

(2) said rule (1) is not essentially applied when any of said passage units is connected to the upstream side of the passage unit with the smallest passage diameter.

5 11. The multistage emulsification/dispersion system according to claim 10, which satisfies the following relationship: $D_0 \geq D_B$, wherein D_0 is the inner diameter of said connection member.

12. A method of producing an emulsified/dispersed liquid,
10 comprising the steps of:

giving a shearing force to a supplied liquid material to emulsify/disperse said liquid material, while applying to said liquid material a backpressure allowing said emulsification/ dispersion to be performed without
15 bubbling; and

reducing the backpressure of said emulsified/dispersed liquid in a stepwise manner so as to allow said emulsified/dispersed liquid to finally have a reduced pressure causing no bubbling even if it is released
20 to atmosphere.

13. A method of producing an emulsified/dispersed liquid, comprising the steps of:

pressurizing and heating a dispersion liquid up to a given pressure or more and a given temperature or more
25 to achieve the critical state of said dispersion liquid,

and giving a high shearing force to said dispersion liquid in critical state to cause emulsification/dispersion therein while applying a backpressure thereto; and

reducing the backpressure of the obtained
5 emulsified/dispersed liquid in a stepwise manner using a plurality of depressurization members so as to allow said emulsified/dispersed liquid to finally have a reduced pressure causing no bubbling even if it is released to atmosphere.